



-  Tribal Lands
-  Drainage Boundary



Area of Interest



Map Produced by:
ASP - Geographic Data Services
ISR 43965 - Nov 23, 2018

Lower Missouri River Drainage

Physical Description

The lower Missouri River drainage encompasses approximately 3,750 square miles of land in Roosevelt, Richland, Sheridan, and Daniels counties. The main artery of the drainage is the Missouri River from the confluence of the Poplar River to the North Dakota border, about 94 river miles. The largest tributary to the Missouri River within the drainage is Big Muddy Creek, which flows north to south through Sheridan and Roosevelt counties and forms the eastern boundary of the Fort Peck Indian Reservation. Agricultural lands dominate the landscape in the northern portions of the drainage, with grain being the dominant crop. To the south of the Missouri River in its furthest downstream portions, sharp breaks in vegetation occur. Throughout the river bottomlands, irrigated agriculture occurs intermixed with intact cottonwood riparian zones.

Box Elder and Whitetail reservoirs are the two largest and most fished flatwater fisheries in the drainage. Box Elder Reservoir is in Sheridan County just north of Plentywood, while Whitetail Reservoir is in Daniels County near Whitetail. Other smaller prairie ponds are located mainly on private land within the drainage.

Fisheries Management

The lower Missouri River, while significantly altered due to the influence of Fort Peck Dam, holds a more naturalized fish assemblage than portions closer to the dam. Native game fishes such as channel catfish, sauger, and shovelnose sturgeon are abundant, as are native nongame cyprinids including sicklefin chub and sturgeon chub. The lower Missouri River is an important juvenile rearing area for several species of fish that spawn further upstream in the system. This is the only area of the Missouri River downstream of Fort Peck Dam where young-of-year sauger, shovelnose sturgeon, and channel catfish are common.

Both wild and hatchery produced pallid sturgeon are found in higher densities within this section of the Missouri River when compared to upstream areas. After stocking, hatchery reared juvenile pallid sturgeon tend to congregate in the lower sections of the Missouri River, most likely due to the higher abundance of forage fish and more natural temperature and turbidity. Growth rates of pallid sturgeon and other native fishes are likely higher in this section due to the increased summer water temperatures.

The Missouri River is managed as a wild fishery, with no stocking of game fish currently taking place. However, both past and current stocking practices in Fort Peck Reservoir have significantly influenced the current fish assemblage. In the past, upper portions of the Missouri River below Fort Peck Dam were stocked with a multitude of species to improve angling opportunities. Many of those fish have colonized the river, including the downstream portions. Today the Missouri River is home to over 50 species of fish, including at least 31 native species and a minimum of 19 introduced species. Due to the more naturalized habitat of the lower Missouri River, introduced fishes are less abundant than in portions of the river closer to Fort Peck Dam.

Fishing regulations for the lower Missouri River are similar to that of the upper portions of the river below Fort Peck Dam, with general Eastern District regulations in place for the majority of species. Since

the Fort Peck Indian Reservation borders a portion of the north side of the Missouri River in this drainage, the Reservation and State have agreed to be consistent with harvest regulations. Anglers fishing on boundary waters (waters adjacent to the Fort Peck Reservation) are allowed one daily bag limit regardless of whether the angler possesses a state or tribal fishing license. Special harvest regulations are in place for paddlefish and trout. Only one paddlefish can be harvested per year and anglers are required to have a yellow tag to fish in the Missouri River downstream of Fort Peck Dam or the Yellowstone River. Limited harvest data exists for paddlefish harvested under a tribal license, therefore, FWP proposes to work with the Fort Peck Tribes to monitor and quantify harvest from the Missouri River.

Monitoring of species assemblages in the Missouri River will expand going forward using a variety of methods including netting, hook and line, and spring and fall electrofishing. Targeted sampling for burbot, sauger, walleye, catfish, paddlefish, and other species will be developed and refined to identify limiting factors to populations. A large-scale fish tagging effort, including implanting radio tags, will occur as part of these efforts. Data will be used to understand population dynamics, movement, age and growth, and angler exploitation.

Big Muddy Creek hosts a wide variety of native and introduced fishes. Little fisheries data have been collected on Big Muddy Creek over the past few decades. Game fish including channel catfish, sauger, and walleye are found in the lower sections of the creek that are connected to the Missouri River. The upper portions of Big Muddy Creek are home to pearl dace, a Species of Concern. Increased monitoring of Big Muddy Creek is anticipated in the future. Seining efforts in upper sections will occur to determine status of pearl dace, as well as lend insight into other native and non-native species present.

Box Elder Reservoir hosts a walleye, northern pike, and yellow perch fishery while also containing a large population of common carp. Conservative yellow perch regulations were implemented on Box Elder Reservoir to limit harvest however, creel surveys conducted in winter 2021-2022 suggest harvest is limited. Box Elder Reservoir is subject to agricultural runoff, resulting in significant algae blooms during the summer. To address this, year-round monitoring of water temperature and dissolved oxygen levels is occurring. Studies will continue to understand walleye and yellow perch recruitment with emphasis on age and growth. Northern pike stocking was discontinued in 2021. Population response of walleye, yellow perch, and common carp will continue to be evaluated because of this change. Further anticipated rehabilitation efforts within Boxelder Reservoir include the placement of artificial habitat structures intended to increase spawning and rearing habitat.

Whitetail Reservoir is a relatively shallow reservoir with a maximum depth of 15 feet. It is prone to winter kill when snow accumulates during prolonged winters. Large die offs were documented in the winter of 2010/2011. Currently, northern pike and yellow perch are both abundant in Whitetail Reservoir and it is a popular ice fishing destination. Creel surveys will continue to be conducted at Whitetail Reservoir.

Several additional prairie ponds within the drainage are stocked with game fishes to provide fishing opportunities. Deeper ponds have been stocked with game fish that are meant to be self-sustaining, such as yellow perch, largemouth bass, and bluegill. Shallower ponds that tend to winter kill are often stocked with hatchery produced rainbow trout. Many of the prairie ponds within the lower Missouri drainage are not currently viable fisheries, as drought conditions has reduced water levels and increased

water temperatures. Anticipated actions because of current water conditions include dissolved oxygen monitoring, as well as altering stocking plans as needed.

Habitat

While still highly altered due to the presence and operations of Fort Peck Dam, the section of the Missouri River in this reach is much more natural in its physical and chemical properties when compared to upstream reaches. This naturalization is largely due to tributary influence, lateral bank erosion and solar radiation. As such, the lower section of the Missouri River is appreciably warmer during the summer and carries much more suspended sediment than upstream sections. A more natural fish assemblage exists and consists of several native fish that are uncommon closer to the dam.

The lower sections of the Missouri River are the most important juvenile rearing areas for several native game fish within the Missouri River. For that reason, it is important to protect these areas by providing the oil and gas industry with up-to-date information which will assist in making informed decisions of how to minimize negative impacts to the aquatic environment. Numerous floating irrigation pumps are located along the river. Fish screens on these pumps are recommended by FWP and mandated through the local conservation districts. Recently, applications are being processed to sell water (market water) to oil companies to be used in the process known as fracking. Fracking involves injecting 1-3.5 million gallons of pressurized water into each oil well to shatter the shale and allow the oil to flow freely. Cumulative impacts of water extraction from the Missouri River will be monitored.

Several road crossings occur along the length of Big Muddy Creek. Documenting these crossings and understanding how they may affect both fish migrations and the preclusion of northern pike is of importance. Irrigation withdrawals also impact the habitat of Big Muddy Creek and during various periods within the year the creek has limited water.

Special Management Issues

Pallid Sturgeon Recovery Efforts

FWP has been collaboratively working with several federal and university partners on pallid sturgeon recovery efforts since the species federal listing in 1990. Management plans and conservation efforts for pallid sturgeon have been developed and implemented through a USFWS coordinated Recovery Team that includes state and federally appointed staff. The USFWS is the lead agency on recovery and in 2018 issued a [Biological Opinion](#) on the Operation of the Missouri River Mainstem Reservoir System, the Operation and Maintenance of the Bank Stabilization and Navigation Project, the Operation of Kansas River Reservoir System, and Implementation of the Missouri River Recovery Management Plan. The 2018 Biological Opinion supersedes previous Biological Opinions (2003 and 2000). The 2018 Biological Opinion concluded that the proposed actions on the Missouri River are not likely to jeopardize pallid sturgeon, with the understanding that the USACOE had committed to a suite of prioritized actions that will have overall beneficial effects on the pallid sturgeon. One of these management actions was a test at Fort Peck Dam on whether increased flows may have a positive effect on pallid sturgeon spawning and recruitment.

Through years of scientific studies and monitoring conducted by a host of entities, including FWP, the leading hypothesis for the lack of recruitment in pallid sturgeon in the Missouri River downstream of

Fort Peck Dam and the Yellowstone River is the lack of available riverine habitat for pallid sturgeon early life history.

When pallid sturgeon eggs hatch, they become pre-larva or free embryos (free of embryonic membrane) that are for the most part at the mercy of the river current. These free embryos utilize their yolk sacks for energy and are not actively foraging. They drift along the bottom of the river while they develop into larvae that are capable of benthically orientating themselves and begin feeding on invertebrates. The time this developmental process takes is highly dependent on water temperature and exhibits a negative relationship where the higher the water temperature they are exposed to the less time development takes. Although development time is variable depending on water temperature, these free embryos need between 5 and 9 days to develop into exogenously feeding larvae. Since they need such a long time to drift, they in turn need a long distance of free-flowing river.

Currently most of the pallid sturgeon that spawn in the lower Missouri and Yellowstone rivers do so near the headwaters of Lake Sakakawea, ND. Studies have indicated that the headwaters of Lake Sakakawea may be acting as a biological sink for any free embryos drifting in the river system. Free embryos are likely drifting into the very low velocity areas of the reservoir headwaters where they settle out in the mud and much of the deltas. These benthic areas covered in mud and muck are likely inhospitable to the fragile pre-larva due to low oxygen levels. Therefore, to give pallid sturgeon free embryos enough time and distance to develop into larva that can swim and eat on their own before reaching the headwaters, the adults need to spawn further upstream than where they currently are.

On the Missouri River, data over the years have indicated that the controlled flows from Fort Peck Dam may be inhibiting the spring migration of pallid sturgeon up the Missouri River. In the few years that spring flows have been higher than the operational norms, pallid sturgeon have migrated upstream. Biologists identified spawning in the Missouri River near the Fort Peck Dam project area during the historically high flows of 2011. Similarly, other higher than average flow years such as 2018 also had a positive response from migrating pallid sturgeon. In addition, biologists have been monitoring hatchery stocked juvenile pallid sturgeon in the Missouri River over the past 20 years. From those monitoring efforts, suitable habitat does exist in the river system to grow pallid sturgeon from juveniles to sexually mature adults.

Large scale pallid sturgeon free embryo drift studies have been conducted multiple times on the Missouri River over the past 20 years. These studies take free embryos produced in a hatchery environment and place them in the Missouri River. Scientists are then able to track the downstream movements and growth of free embryos over the length of the Missouri River. These studies have shown that if pallid sturgeon free embryos are placed in the river a portion of them will recruit to older age classes. Because it is now known that free embryos can survive and grow in the Missouri River if placed far enough up stream, the next question is whether pallid sturgeon will spawn in the upper reaches of the Missouri River near the Fort Peck Dam project.

Based on decades of research, the USACOE completed an [EIS for Fort Peck Dam during 2021](#). The purpose of the EIS is to assess the capacity of test flows from the Fort Peck Dam to promote the growth and survival of pallid sturgeon. The EIS describes the formulation of alternative plans, presents analyses of predicted benefits and environmental impacts; identifies a preferred alternative, discusses uncertainties, and considerations for implementation. The Final EIS was filed with the Environmental Protection Agency in September and the review period ended on October 25th, 2021.

On November 12, 2021 the USACOE issued a [Record of Decision](#) (ROD) on Fort Peck Dam Test Release Environmental Impact Statement Fort Peck Dam, Montana. Within the ROD the USACOE identified its preferred alternative. To avoid and minimize some of the adverse effects associated with the test flow, it would only be implemented in years when the hydrological conditions are favorable to stakeholders. Because the test flow is experimental, it is anticipated that the test flow would only be run 3-5 times. Due to the current drought conditions of the Missouri River Basin, it is not yet clear what year the flow tests will be conducted.

When implemented, the test flow would consist of four components: attraction, retention, spawning and drift. Attraction flows would begin around April 16 with peak flows approximately twice as large as the typical spring release from Fort Peck Dam. Following attraction flows, retention flows will be approximately 1.5 times larger than typical flows and would persist until May 28th. On May 28th the release will increase over a series of days until it reaches approximately 3.5 times the normal spring flow. The spawning flow of 3.5 times the normal would be held for 3 days. After spawning, flows will be decreased by 1,000 cfs per day for 12 days and then reduced by about 3,000 cfs a day until the target drift flow of 8,000 cfs is obtained. All increases and decreases will be conducted over a series of days. All flow calculations for the test will be conducted at the Wolf Point USGS gauging station. To meet the flow objectives, water may be released over the Fort Peck Spillway. However, since flow will be conducted at Wolf Point, the flow will be made up of water coming through the Fort Peck powerhouse, the Milk River and other smaller tributaries and spillway flows.

The USACOE has several test flow constraints to avoid or minimize impacts to stakeholders. The test flows can only occur in a water year with less than the upper quartile of runoff. This is to make sure the test flows do not coincide with a high-water year which would potentially lead to flooding. Fort Peck Reservoir elevation will need to be at least at 2,227 ft msl, which will make sure the reservoir does not drop too low. There will be flow limits at both Wolf Point and Culbertson gauging stations of 35,000 cfs. This is to reduce the potential of flooding landowners and municipalities. Garrison Reservoir (Lake Sakakawea) cannot have a pool elevation over 1,850 ft msl, to reduce the chances of having to spill water at Garrison Dam. There are also maximum river elevations that can occur near Williston, ND to decrease the chance of flooding. In addition, to reduce the amount of bank sloughing and to make it easier on irrigators to move their pumps, the maximum flow reduction rate during a flow test cannot exceed 3,000 cfs per day.

During and after the test flows, monitoring of the physical and biological responses will occur. Bank erosion, water intakes, pre and post water elevation profiles, pre during and post aerial photography and several aspects of monitoring the spillway will occur. Biological sampling will be conducted by FWP, the USGS and the USFWS. Monitoring of pallid sturgeon will be extensive and will include monitoring movements, spawning, production of free embryos, recruitment to the larva stage and over several years monitoring of potential recruitment to older age classes.

Native Species Conservation

Several Species of Special Concern exist within the lower Missouri River drainage. Many species such as pallid sturgeon, paddlefish, sauger, and blue sucker are tied to the Missouri River and others, such as pearl dace, are found in tributaries. While the mainstem Missouri River has had a lot of survey data collected over the past 20 plus years, relatively few surveys or studies have been done on tributary

streams like the Big Muddy Creek system. Pearl dace are known to occur at localized sites in relatively low densities within the Big Muddy watershed. Both Montana State University and the Montana Heritage Program conducted surveys of native fishes within the Big Muddy drainage in the early and middle 2000's. Both surveys found a negative relationship between the presence of non-native northern pike and native species richness. In particular, pearl dace were only found in a few localized areas above barriers from the mainstem Big Muddy Creek.

More recently, pearl dace were sampled within Plentywood Creek and Eagle Creek. Further sampling of both creeks is needed to better understand distribution and densities of this species. In conjunction with fish sampling, a broad assessment of the habitats may lend insight the current threats on pearl dace within this system. To conserve native fishes and especially pearl dace in tributaries, more surveys are needed within the lower Missouri River drainage, with particular focus on existing barriers and northern pike distribution. Anticipated activities to accomplish this include flight surveys to identify fish barriers and habitat features, as well as standardized seining surveys investigating fish assemblage.

FISHERIES MANAGEMENT DIRECTION FOR LOWER MISSOURI RIVER DRAINAGE

Water	Miles/Acres	Species	Recruitment Source	Management Type	Management Direction
Missouri River - Confluence of Poplar River to North Dakota border	94 miles	Pallid sturgeon (N)	Wild/ Hatchery	Conservation	Restore a self-sustaining population of pallid sturgeon in the Missouri River. Assist in monitoring before, during and after the Fort Peck Flow test.
		Paddlefish (N)	Wild	Restrictive Regulations	Continue to allow the unique opportunity for snagging in the Missouri River. Monitor populations and angler harvest. Work with Fort Peck Tribes to better understand harvest.
		Burbot (N)	Wild	Conservation	Better understand population dynamics, limiting factors and angler exploitation.
		Shovelnose sturgeon (N), Channel catfish (N)	Wild	General	Monitor populations to better understand how operations of Fort Peck Dam and the Missouri River's tributaries influence production, recruitment, and population structure.
		Sauger (N)	Wild	Conservation	Monitor population to ensure sustainable harvest. Evaluate distribution and relative abundance with regard to walleye. Collect genetic samples and continue to evaluate hybridization with walleye.
		Walleye	Wild	General	Emphasize angler harvest to minimize potential for hybridization with native sauger. Monitor relative abundance.

Water	Miles/Acres	Species	Recruitment Source	Management Type	Management Direction
		Native nongame fishes (N)	Wild	General	Monitor native nongame fishes to better understand how operations of Fort Peck Dam and tributaries influence these populations. Evaluate use as bait by anglers. Continue to educate public of proper fish identification to limit use of illegal species.
Habitat needs and activities: Work towards modifying operations at Fort Peck Dam that are beneficial for spawning and growth of pallid sturgeon and other native species. Minimize further anthropogenic impacts to habitat. Work with irrigators to ensure irrigation pumps remained screened.					
Big Muddy Creek (Canadian border to mouth) Eagle Creek, Plentywood Creek	194 miles	Channel catfish (N), Sauger (N)	Wild	General	Maintain numbers.
		Pearl dace (N)	Wild	Conservation	Determine current distribution. Work to conserve species via habitat improvements/nonnative species suppression.
		Native nongame fishes (N)	Wild	Conservation	Protect habitat for native fishes. Provide fish passage at stream crossings.
		Pearl dace (N)	Wild	Conservation	Determine current distribution. Work to conserve species via habitat improvements/nonnative species suppression.
		Northern pike	Invasive	Suppression	Determine current distribution. Remove or isolate when conditions demonstrate positive benefit to native species populations.
Habitat needs and activities: Evaluate anthropogenic impacts to streambanks. Inventory potential barriers to fish passage via flight surveys. Increase seining efforts. Restore passage between sections lacking nonnative northern pike.					

Water	Miles/Acres	Species	Recruitment Source	Management Type	Management Direction
Box Elder Reservoir	77 acres	Yellow perch	Wild/ Transfer	Restrictive Regulations	Monitor reproduction and recruitment to maintain high abundances of adult yellow perch. Transfer adults if necessary. Evaluate angler exploitation.
		Walleye	Hatchery	General	Evaluate population response of fry to fingerling stocking change. Investigate wild contribution by stocking marked fingerlings.
		Northern pike	Wild/ Hatchery	General	Discontinue stocking. Monitor fishery response.
		Common carp	Invasive	Suppression	Monitor fishery response to large scale harvest/removal efforts and northern pike stocking change.
		Rainbow trout	Hatchery	Put- Grow- and- Take	Increase stocking to serve as potential prey source for other game fish.
Habitat needs and activities: Lack of forage species and juvenile yellow perch suggests absence of spawning habitat or suitable refuge from predators. Implement artificial habitat structures. Year-round water quality monitoring. Work with landowners within watershed to implement best management practices that minimize agricultural runoff.					
Whitetail Reservoir	25 acres	Yellow perch, Northern pike	Wild	General	Continue to monitor populations. Stock fish after winter kills. Evaluate balance between yellow perch and northern pike.
		Rainbow Trout	Hatchery	Put- Grow- and- Take	Evaluate angler return in response to stocking increases.
Habitat needs and activities: Creel survey will be conducted during winter months. Continue to evaluate age and growth of yellow perch.					

Water	Miles/Acres	Species	Recruitment Source	Management Type	Management Direction
Prairie Ponds	Various	Yellow perch, Largemouth bass, Northern pike, Black crappie, Bluegill	Wild	General	Continue to monitor these populations and stock/transfer fish when necessary. Evaluate age structure of yellow perch throughout drainage.
		Rainbow trout	Hatchery	Put- Grow- and- Take	Continue to stock prairie ponds as put-and-take fisheries. Evaluate angler use and which ponds should be stocked.
		Native nongame fishes (N)	Wild	Conservation	Evaluate use of native nongame fish as bait by anglers. Continue to educate public of proper fish identification to limit use of illegal species.
<p>Habitat needs and activities: Look for opportunities to increase quality of habitat by increasing depth of reservoirs, building new reservoirs, and other habitat improvements. Explore applicability of windmill aerator systems at prairie ponds with winterkill concerns. Utilize artificial habitat structures in ponds where rearing habitat is limited. Alter stocking plan as needed in response to drought.</p>					